

Perbandingan Metode Ekstraksi secara Konvensional dan Nonkonvensional serta Uji Penghambatan Aktivitas Alfa-glukosidase pada Ekstrak Biji Coix lacryma-jobi L. var. ma-yuen = Comparison of Conventional and Nonconventional Extraction Methods and Alpha-glucosidase Inhibitory Activity of Coix lacryma-jobi L. var. ma-yuen Seeds Extract

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Abstrak

Alfa-glukosidase merupakan enzim yang menghidrolisis ikatan glikosida pada polisakarida kompleks menjadi monosakarida. Penghambatan enzim ini akan menunda absorpsi monosakarida ke dalam epitelium usus, sehingga menurunkan kadar gula darah postprandial. Penelitian ini bertujuan untuk mengetahui potensi penghambatan aktivitas alfa-glukosidase dari ekstrak biji Coix lacryma-jobi L. var. ma-yuen. Biji Coix lacryma-jobi L. var. ma-yuen diekstraksi dengan metode maserasi, refluks, Ultrasound Assisted Extraction (UAE), dan Microwave Assisted Extraction (MAE). Penetapan kadar flavonoid total dilakukan menggunakan metode kolorimetri AlCl_3 , dan kadar fenol total dilakukan menggunakan metode Folin Ciocalteu. Penghambatan aktivitas alfa-glukosidase dilakukan menggunakan p-Nitrofenil--D-Glukopiranosida (pNPG) sebagai substrat dan akarbose sebagai standar. Hasil penelitian menunjukkan bahwa rendemen ekstrak yang diperoleh dari metode maserasi, refluks, UAE, dan MAE secara berurutan adalah 5,41; 6,54; 7,12; dan 7,35%. Kadar flavonoid total yang diperoleh dari metode maserasi, refluks, UAE, dan MAE sebesar 15,59; 14,82; 15,24; dan 14,35 mgEK/g ekstrak, dan kadar fenol totalnya adalah 98,16; 88,5; 95,71; dan 87,63 mgEAG/g ekstrak. Ekstrak dari metode maserasi mempunyai penghambatan aktivitas yang paling kuat terhadap enzim alfa-glukosidase ($\text{IC}_{50} = 84,44 \text{ g/mL}$) dibandingkan dengan metode refluks, UAE, dan MAE ($\text{IC}_{50} = 90,44; 86,87; \text{ dan } 94,26 \text{ g/mL}$).

.....Alpha-glucosidase is an enzyme that hydrolyze glycosidic bonds in polysaccharides into monosaccharides. Inhibition of this enzyme will reduce the absorption of monosaccharides into intestinal epithelium, resulting in a decrease of postprandial glucose levels. This study aims to determine the alpha-glucosidase inhibitory activity of Coix lacryma-jobi L. var. ma-yuen seeds extract. Coix lacryma-jobi L. var. ma-yuen seeds were extracted by maceration, reflux, Ultrasound Assisted Extraction (UAE), and Microwave Assisted Extraction (MAE) methods. Total flavonoid content was measured using the AlCl_3 colorimetric method. Total phenolic content was measured using Folin-ciocalteu method. Alpha-glucosidase inhibitory activity was determined using p-Nitrophenyl--D-Glucopyranoside (pNPG) as substrate and Acarbose as a positive control. The yields obtained from the maceration, reflux, UAE, and MAE methods were 5.41; 6.54; 7.12; and 7.35%, respectively. The total flavonoid content obtained from the maceration, reflux, UAE, and MAE methods were 12.47; 15.59; 14.82; 15.24; and 14.35 mgQE/g extract, respectively, and the total phenolic content were 98.16; 88.5; 95.71; and 87.63 mgGAE/g extract. The maceration method extracts had the strongest alpha-glucosidase inhibitory activity ($\text{IC}_{50} = 84.44 \text{ g/mL}$) compared to reflux, UAE, and MAE methods ($\text{IC}_{50} = 90.44; 86.87; \text{ and } 94.26 \text{ g/mL}$).